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Holzmann receives rare academy election

By Mark Whalen



Dr. Gerard Holzmann

DR. GERARD HOLZMANN, who is involved in efforts to improve the reliability of JPL's mission-critical software systems, has achieved the rare and prestigious honor of election to the National Academy of Engineering.

Holzmann joins Dr. Charles Elachi, the JPL director, and John Casani, manager of the Project Prometheus Office, as the only current Lab employees who are academy members. Retirees Lew Allen and Bob Parks are also members.

Holzmann joined JPL in May 2003 to develop the newly established Laboratory for Reliable Software, which conducts research that targets the application of both new and existing formal verification techniques to mission software. The election to the academy recognizes Holzmann's career-long work in software reliability, with a particular emphasis on logic model checking.

"The academy is a very prestigious body," Holzmann said. "This is quite an honor."

Holzmann—who worked for more than 20 years as a researcher at Bell Laboratories—is credited with the development of Spin, a highly successful and widely used software model-checking system. Spin was initially developed to assure dependability in complex telephone switching systems, which have stringent reliability requirements. But as computers have become more powerful, this verification tool has found applications in everything from Internet protocol software and railway-signaling systems to distributed control software essential to the correct functioning of nuclear power plants and spacecraft.

When he joined the Lab, Holzmann was quoted as saying, "JPL has some of the most difficult software challenges on the planet." Does he still believe that today?

"Yes, even more so than when I started here," he said. "For one thing, the software built here becomes very difficult to access. With a telephone switch, you can always open it up and see what's going on. Of course, we can't do that very easily with a spacecraft in flight. There's the fascinating additional problem of being able to maintain and debug a system that may be millions of miles away.

"One thing I learned since I came here is how smart people are in building these systems and making it possible to recover from occasional mishaps," he added. "There are all sorts of software malfunctions that can be completely unpredictable.

"It's very hard to produce something of significant complexity that is absolutely flawless. That is true for anything humans do. But the design can be robust enough that it doesn't matter that there are a few small problems, because the rest of the architecture can be designed to recover from the occasional malfunctions. This is the art of building reliable systems from unreliable parts, and the people at JPL are very good at that sort of thing."

Working side by side with the principals of the Software Quality Initiative, Holzmann works with Laboratory for Reliable Software colleagues Rajeev Joshi and new hire Alex Groce. The group's work has included pre-launch software analysis for the Spitzer Space Telescope and Mars

Exploration Rovers. Some MER analysis was also done during the cruise phase. The members of LARS also participated on a tiger team for the Deep Impact mission.

Holzmann's long-term goal is to reduce by an order of magnitude the number of residual defects in flight software that remain after testing. "At that point, for a really good software process, there are typically between 1 to 10 residual defects for every 1,000 lines of code. We want to be able to reduce that by a factor of at least 10 in the next few years."

The Laboratory for Reliable Software has researched technology that is the closest to being ready to infuse into the mission-development process. "We did a broad evaluation of state of the art static analysis tools that are available now; one of them that I developed is called UNO," Holzmann said. "We have evaluated these tools for typical JPL flight software to see how well they do and prove which ones perform the best."

Holzmann recognizes that while his lab can develop the methodologies and tools, that does not mean those tools will automatically get adopted. "You really have to convince people that there is something to be gained by making a change.

"Just before a launch, for example, there's no time to redo anything or to change a process," he said. "The risk of making a change in the process is too great, even though there may be benefits. You have to work efficiently from the start of the cycle. That's why it might take a few years for mature technology to be integrated into the design phase of a mission."

Pushing the state of the art, Holzmann has done much work in logic modeling techniques. "This is something we can really take advantage of—doing design verification based on logical models fairly early in the design process," he said. "We're working on this, but we have a long road before we reach full integration into a mission.

"The phenomenon we're seeing in software on spacecraft is that every new mission uses more software than the one before, and the expected number of residual defects goes up with the number of lines of code," he said. "So the potential risk that is introduced by software slowly increases over time. It then becomes ever more critical to be able to find software defects before launch. If we don't do anything, the problems may get out of hand. We have to get smarter about handling the software design and testing process.

"Maybe in about five years we will have reached the point where it becomes routine."

Holzmann is secure in the knowledge that as technologies advance, the need for the software research function he and his laboratory provides will always be an asset to the Lab.

"Software reliability issues won't easily go away," he said. "At some point, the technology gets encapsulated into standards and design templates. But humans being who they are, they don't stay within what is known; they want to expand beyond that, and that's probably where there will remain a strong need for our work."

Continued on page 4

JAMES DONALDSON of the Avionic Systems and Technology Division 34 has been awarded NASA's Quality And Safety Achievement Recognition (QASAR) Award, which promotes safety, quality, and continuous improvement throughout the agency.

Donaldson was cited for leading a team that identified a possible problem that may have precluded proper firing on the Mars Exploration Rovers' pyro circuits just hours before the rovers' entry, descent and landing. Through testbed analysis, the team of eight people determined the need for and tested spacecraft commands that helped the rovers to complete their successful landings on the Red Planet.

This marks the first time that JPL has had a QASAR winner since 1997, said Matt Landano, director of the Office of Safety and Mission Success. Landano and other NASA center Safety and Mission Assurance directors submit nominations for the awards and then vote on them for agency-wide honors. Donaldson received a unanimous vote for the QASAR.

The QASAR recognizes NASA government and contractor employees who have displayed exemplary performance in contributing to the quality and/or safety of products, services, processes, management programs and activities, or the working environment. Headquarters and each center have local QASAR Award programs; annually the "Best of the Best" in each of four categories—NASA Safety and Mission Assurance; NASA outside SMA organization; other non-NASA government agency; and NASA prime or subcontractor—are selected at the agency level.



James Donaldson

QASAR award honors aid to rover landing



Dr. Firouz Naderi

Naderi gets NASA's highest award

DR. FIROUZ NADERI, Manager of JPL's Mars Exploration Program, has been awarded NASA's Distinguished Service Medal, the highest award that the agency bestows.

The medal citation recognizing Naderi's 26-year JPL career reads: "In recognition of your sustained exceptional contribution to space science and exploration."

The medal and the citation—which was signed by NASA Administrator Sean O'Keefe on Jan. 3, appropriately the one-year anniversary of Spirit's landing on Mars—were presented to Naderi in Washington, D.C. by NASA Associate Administrator for Space Science Al Diaz.

Prior to leading JPL's Mars Program, Naderi managed NASA's Origins Program, an ambitious plan to search for other Earths around other Suns. Earlier positions included program manager for space science flight experiments and project manager for the NASA Scatterometer, which monitored winds from Earth orbit.

News Briefs



Dr. Yoseph Bar-Cohen



Dr. Lucien Froidevaux

Bar-Cohen receives honor

DR. YOSEPH BAR-COHEN, senior research scientist and group leader for Nondestructive Evaluation and Advanced Actuators, is the co-recipient of the International Society for Optical Engineering's Smart Materials and Structures Lifetime Award for 2005.

Bar-Cohen received the honor as a result of voting by about 65 past and present Smart Materials and Structures conference chairs.

An award ceremony will be held March 7 at the organization's 2005 conference in San Diego.

Bar-Cohen, a physicist, joined JPL in 1991. That year, he established the Nondestructive Evaluation and Advance Actuators Lab (<http://ndcaa.jpl.nasa.gov>), which has been responsible for a series of innovative concepts and mechanisms for planetary explorations, medical, commercial and other applications.

Bar-Cohen is a Fellow of both the International Society for Optical Engineering and the American Society for Nondestructive Testing.

Froidevaux cited for refereeing

DR. LUCIEN FROIDEVAUX of Section 328 recently earned the 2004 Editor's Citation for Refereeing for the Journal of Geophysical Research-Atmospheres, a twice-monthly publication of the American Geophysical Union.

One of the most important services performed for AGU is the conscientious reviewing of submitted papers. Because of the nature of the reviewing process, this service is also one of the least recognized.

The AGU said the assistance of the atmospheric science community to ensure high-quality refereeing is of pivotal importance to achieving a uniformly high standard for the quality of manuscripts accepted for publication in JGR-Atmospheres.

Froidevaux is a member of the science team for JPL's Microwave Limb Sounder onboard the Aura spacecraft.

Helium experiment produces whistle

In research conducted for the JPL-managed Quantum Technology in Life Support and Habitation Program, it was music to the ears of UC Berkeley physicists when they forced liquid helium-4 through thousands of tiny holes and heard a whistling sound.

Why the big fuss about an odd sound? It seems this breakthrough might eventually lead to enhanced earthquake studies and more accurate navigation systems, including the Global Positioning System (GPS).

It all starts with one slippery liquid: helium-4. Ultra-cold helium-4 becomes a superfluid, meaning it flows without friction.

The scientists squashed it through an array of apertures 1,000 times smaller than the width of a human hair. The liquid whooshed faster and faster, until it reached a critical velocity.

At that point, in a strange phenomenon, a microscopic quantum whirlpool dashed across each aperture, carrying away some of the helium-4's flow energy. This abruptly slowed the flow. The fluid repeatedly sped up and slowed down, creating vibrations that produced a whistling sound going from high to low.

Packard said this new phenomenon might lead to improved whistling superfluid navigation gyroscopes that detect extremely small rotational motion. As their motion changes, the whistle's volume would change. This would be especially useful on submarines or airplanes in regions where GPS signals are unavailable.

The GPS navigation system relies on knowing the state of Earth's rotation. Because weather and other factors affect Earth's rotation, the GPS system needs constant updating for accuracy.

A recording of the sound, called a quantum whistle, is available online at <http://www.nasa.gov/vision/earth/technologies/whistle.html>.

JPL software receives NASA honors



Bob Brown / JPL Photolab

The Science Activity Planner, a JPL-developed software package that is used in support of the Mars Exploration Rover missions, was recognized by NASA as the 2004 NASA Software of the Year. JPL Chief Technologist Erik Antonsson, left, presented the Software of the Year medals to Mark Powell, Jeffrey Norris and Paul Backes. Not in attendance but also receiving medals were Marselle Vona and Justin Wick.



Bob Brown / JPL Photolab

Lab hosts Science Bowl regional

Members of the Santa Monica High School "A" Team, with JPL Chief Engineer Brian Muirhead at right, mark their victory in the National Science Bowl regional competition held on Lab Feb. 12. They will be among 66 teams that will advance to the National Science Bowl finals held April 28-May 2 at the National 4-H Center near Washington, D.C. Santa Monica defeated 23 teams in the JPL regional.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meets Wednesdays at 11:30 a.m.

Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place).

Codependents Anonymous—Meets at noon every Wednesday.

Lambda (Gay, Lesbian, Bisexual and Transgender Networking Group)—Meets the first Friday and third Thursday of the month at noon in Building 111-117. For more information, call Randy Herrera, ext. 3-0664.

Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

For more information on any of the support groups, call the Employee Assistance Program at ext. 4-3680.

Friday, February 25

Von Kármán Lecture Series—Julie L. Webster, Cassini spacecraft operations manager, will present "Capturing the 'Lord of the Rings'" at 7 p.m. in Pasadena City College's Vosloh Forum, 1570 E. Colorado Blvd. For more information, call Public Services at ext. 4-0112.

Saturday, February 26

Caltech Ballroom Dance Club—The end-of-term party will be held beginning at 8:30 p.m. in Winnett Lounge. Admission is free.

Caltech-Occidental College Concert Band—The band's annual concert will be presented at 7:30 p.m. in Occidental College's Thorne Hall. Featured will be "The Lord of the Rings," a five-movement suite composed especially for concert band. For more information, call (323) 259-2785.

Sunday, February 27

Chamber Music—The Cavani String Quartet will perform at 3:30 p.m. in Caltech's Beckman Auditorium. Tickets are \$29, \$25, \$21 and \$17. For more information, call (626) 395-4652 or visit www.events.caltech.edu.

Monday, February 28

Do the Hustle—The Caltech Ballroom Dance Club will present one in a series of classes taught by a dance professional from 8 to 9:30 p.m. in Winnett Lounge. No partner is required but some previous knowledge of hustle is helpful. Cost: \$8/class.

Tuesday, March 1

Financial Night—Presented by the JPL New Professionals Network from 5 to 6:30 p.m. at the Caltech Employees Federal Credit Union, 528 Foothill Blvd., La Cañada. Topics of discussion will include the benefits of credit union membership, controlling your finances and credit before age 30 and why Generation X is different.

JPL Gamers Club—Meeting at noon in Building 301-227.

JPL Genealogy Club—Meeting at noon in Building 301-271.

The Future of Space?—Join Elon Musk, chairman and CEO, Space Exploration Technologies (SpaceX), for "Revolutionizing the Cost and Reliability of Access to Space" from 4:45 to 6 p.m. in von Kármán Auditorium.

Tues.-Thurs., March 1-3

U.S. Savings Bonds Drive—The National Bond and Trust Company will be on Lab from 9 a.m. to 2 p.m. to discuss Savings Bonds through payroll deduction. Locations: Tuesday, 167 cafe; Wednesday, 303 cafe; Thursday, 601 lobby. If you can't make it or want to change existing bonds, call the National Bond and Trust Company at (800) 321-8024. For more information, visit <http://hr.jpl.nasa.gov/esr/savings/index.htm>.

Wednesday, March 2

Associated Retirees of JPL/Caltech—Meeting at 10 a.m. at La Cañada United

Methodist Church, 104 Berkshire Place, La Cañada. Call (626) 794-1698 to leave a message for a board member.

Exploration Systems Mission Directorate Labwide Briefing—The president's Vision for Exploration and JPL's current and possible future engagement with ESMD will be discussed from 11 a.m. to 12:30 p.m. in von Kármán Auditorium.

JPL Library Orientation—Stop by at 11:30 a.m. at Building 111-104 for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

Thursday, March 3

Investment Advice—Fidelity will offer one-on-one counseling in T1720. For an appointment, call (800) 642-7131.

JPL Gun Club—Meeting at noon in Building 183-328.

Friday, March 4

"A Different Look at Diversity"—As part of Black History Month, the African American Resource Team will present a lecture by Equal Employment Opportunity manager and author Cynthia Todd-Takeyama at 12:30 p.m. in the 167 conference room.



Monday, March 7

JPL Softball—An organizational meeting will be held at 11:30 a.m. in the 180-101 conference room. All team managers and interested players not currently affiliated with a team should attend. For more information, visit <http://jplrecclubs.caltech.edu/softball> or call Scott Morgan at 4-4972 or Rich Benesh at 4-3748.

Tuesday, March 8

JPL Stamp Club—Meeting at noon in Building 183-328.

Wednesday, March 9

JPL Amateur Radio Club—Meeting at noon in Building 238-543.

JPL Toastmasters Club—Meeting at 5 p.m. in conference room 167. Call Dirk Runge, ext. 3-0465, or visit www.jplcaltechtoastmasters.com.

JPL Library Orientation—Stop by at 11:30 a.m. at Building 111-104 for an overview of the Library's products and services, and learn how to access numerous electronic resources from your desktop. For more information, call the reference desk, ext. 4-4200.

"Lifting the Cosmic Veil: The Infrared Universe Revealed by the Spitzer Space Telescope"—Spitzer Chief Scientist Dr. Michael Werner will give a free lecture at 8 p.m. in Caltech's Beckman Auditorium. For more information, call (626) 395-4652.

TIAA/CREF Enrollment Meeting—This workshop, to be held at noon in Building 180-101, is designed to assist employees newly eligible for the Caltech/JPL retirement plan with selection of investment options and the completion of their enrollment forms.

Thursday, March 10

Clogging Class—Meets at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024.

JPL Web Developers—Meeting at noon in the 167 conference room. Topic: "Hosted MySQL for Web Sites" by Doug Hughes, JPL MySQL service engineer. For more information, visit <http://webmasters.jpl.nasa.gov> or contact webdev-chairs@jpl.nasa.gov.

Friday, March 11

The Invisible Man—The Aquila Theatre Company will perform at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$22, \$18 and \$14; high school age and younger, \$10. For more information, call (626) 395-4652.

JPL Rules! goes to the Air Force

By Susan Braunheim-Kalogerakos

The Lab's "JPL Rules!" system is being used to help a local U.S. Air Force base structure its own document management system.

JPL Rules! is the official repository for institutional governing documents for JPL. Its success was identified by the Los Angeles Air Force Base (LA AFB) in El Segundo as a best practice worth emulating. As a result, they sent 1st Lt. Andrew Huckstadt and 2nd Lt. Richard Quinton to the Lab to analyze and document the system. The lieutenants spent about four months on Lab starting in September of last year.

The two airmen were tasked with generating a set of requirements for a Space and Missile Systems Center (SMC) web-based document management system similar to JPL Rules!, but tailored to their needs. The SMC, based at the LA AFB, is responsible for the acquisition of military space systems. The lieutenants looked at both the functionality of the system and the processes associated with JPL Rules!

Col. James Horejsi is the SMC chief engineer and deputy director of systems acquisition at LA AFB. "It took only one look at JPL Rules! to immediately recognize its potential usefulness to the SMC," he said. "We had lost our discipline when it came to documenting our processes and JPL Rules! offered an opportunity to regain that discipline by building on their experience."

The airmen learned a lot from their time spent on Lab. Quinton, a systems integration officer, said one lesson learned was to "look at process before technology. We need to have all of our processes laid out before going ahead with implementation. JPL Rules! became institutionalized through customer satisfaction. The JPL Rules! staff works very hard at delivering for their customers. If we plan to achieve the same success in institutionalizing our system, we will have to be customer focused."

According to Huckstadt, an acquisition systems engineer, one of the reasons JPL Rules! has been so successful is because "the JPL Rules! staff gathered feedback from users and made improvements based on their comments. This resulted in user buy-in and produced a sense of loyalty towards the system." LA AFB will be able to benefit from these and many other lessons learned at JPL when implementing their system.

Another benefit for the lieutenants in partnering with JPL is in the experience itself. According to Col. Rakesh Dewan, director of system engineering for SMC and the lieutenants' supervisor, "I see the confidence these young officers have gained by actually applying their education and delivering an end product to senior engineers, especially when they receive praise for their work and see their recommendations implemented as presented. The joint training effort between LA AFB and JPL builds confidence in our new lieutenants."

As a result of the time spent scrutinizing the JPL Rules! system, the lieutenants were able to create the "SMC Repository Requirements Document." This will serve as the "how-to guide" for the Air Force in developing its version of JPL Rules! This document has also allowed the JPL Rules! team to see their system from an outside perspective.

Dr. Jerry Suitor is manager for the Office of the Management System, the office where JPL Rules! resides. "This document will help provide information to others who are in-



Bob Brown / JPL Photolab

From left: Jerry Suitor, Col. James Horejsi, Col. Rakesh Dewan, 1st Lt. Andrew Huckstadt, Lora Mitchell, 2nd Lt. Richard Quinton, Dan Hoffman.

terested in the JPL Rules! concept and can describe the approach and requirements from a useful outside perspective," Suitor said. "Sandia National Laboratories, Air Products, Bechtel Dickinson, Kimberley Clark and Schneider National Trucking have already expressed a desire to have this document. The maturity of the Rules! system is also being recognized by the NASA family. Next month, Lora Mitchell, the JPL Rules! group supervisor, will receive the 'Continual Improvement Team' award at NASA's prestigious annual 'Continual Improvement and Reinvention Conference.'"

Dan Hoffman, a JPL senior systems engineer for the Office of the Management System, acted as the project manager and mentor to the lieutenants. "The document delivered to us will be used to introduce other organizations to JPL Rules! and to the processes underlying institutional document management," Hoffman said. "The project has enhanced our ability to work with and learn from each other. Its success has eclipsed our expectations."

Another of JPL's long-term goals when partnering with the Air Force is to establish a working relationship with LA AFB on matters of common interest relating to institutional governance.

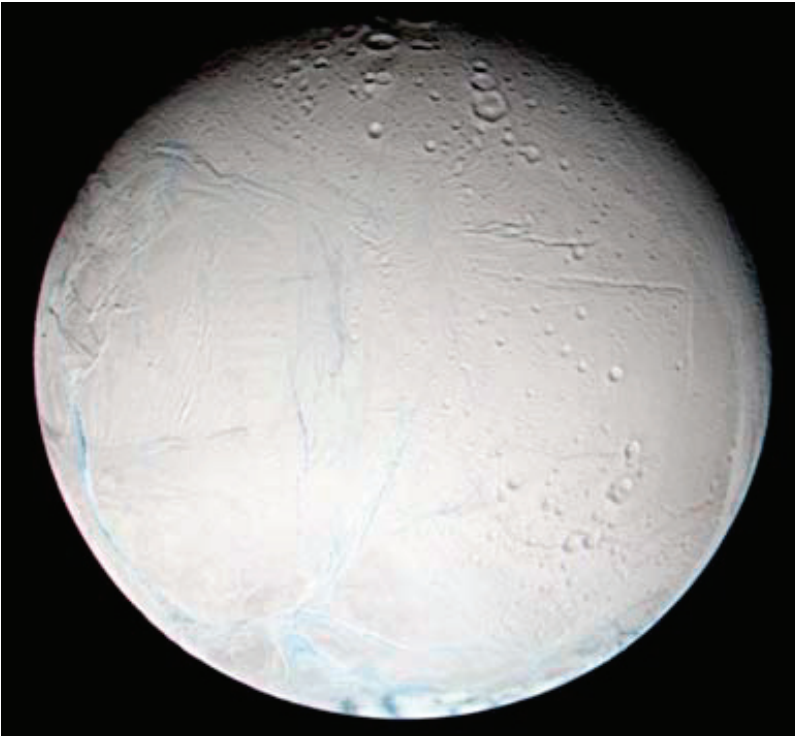
Deputy Director General Eugene Tattini helped facilitate JPL's relationship with the Air Force. "Both JPL and the Air Force have an elaborate system of governance documents," he said. "This is a perfect opportunity for both of us to learn from each other."

The Air Force document control system will serve the 6,000 people, including civilian personnel, on base and should be implemented within the next year or two.

Cassini logs more Saturn moon images

By Carolina Martinez

The new view of Enceladus shows some of the smooth plains noted in Voyager spacecraft images and earlier Cassini images. At about the 7 o'clock position are interwoven linear patterns that are reminiscent of the wispy-terrain features on two of Saturn's other moons, Dione and Rhea.



JPL's Cassini spacecraft had a busy time last week, snapping stunning new images of two of Saturn's moons—smoggy Titan on Feb. 15 and wrinkled Enceladus on Feb. 16.

Visible in radar images released Feb. 18 are a crater, channels and terrain similar to the area where the European Space Agency's Huygens probe landed on Jan. 14.

The crater is approximately 60 kilometers (37 miles) in diameter. Earlier last week, the radar team released an image of a giant impact crater dubbed "Circus Maximus," about 440 kilometers (273 miles) wide.

"The appearance of the small crater and the extremely bright, hence rough, blanket of material surrounding it is indicative of an origin by impact," said Cassini interdisciplinary scientist Dr. Jonathan Lunine of the University of Arizona.

From the crater's size, scientists estimate that it was created when a comet or asteroid roughly 5 to 10 kilometers (3 to 6 miles) in size slammed into the surface of Titan. The feature lacks a central peak, suggesting that it has been eroded or otherwise modified since formation.

Rainfall, wind erosion, and softening of the solid material in which the crater formed are all possible processes that might have altered this impact feature.

Also visible in the images are channels located just east of Circus Maximus, the large impact crater. The longest channel is approximately 200 kilometers (124 miles) long. The channels appear to flow from the slopes of the crater. The fluid was most likely liquid methane, given the extremely cold ambient conditions at the surface of Titan. The area some-

what resembles the rubble-strewn plains in the region where the Huygens probe landed.

Just one day after the Titan flyby, Cassini turned its sights on Saturn's moon Enceladus, revealing a fascinating, tortured world of ice. The spacecraft swept within 1,180 kilometers (730 miles) of the moon's wrinkled surface, providing the first-ever high-resolution images of this world with the brightest, most reflective surface in the solar system.

Since JPL's Voyager spacecraft flew past Enceladus in 1980 and 1981, planetary scientists have been intrigued by the moon's wrinkled terrain and smooth plains, some of which appeared to be relatively free of impact craters. Smooth, crater-free surfaces on moons and planets indicate geologically young ages, while wrinkles may indicate tectonic activity or volcanism.

"Cassini has now viewed these terrains at almost 10 times better resolution than Voyager," said Cassini imaging team leader Dr. Carolyn Porco of the Space Science Institute in Boulder, Colo. "Interestingly, the icy surface of Enceladus appears to have similarities to both Europa and Ganymede—two prominent icy satellites of Jupiter—and topographic relief of about 1 kilometer (.6 miles). Both Europa and Ganymede are thought to have subsurface water layers, or 'oceans,' so the similarities with Enceladus are intriguing."

One view released last week is a high-resolution mosaic showing complex systems of fractures and resurfaced terrain. Among the most intriguing features in the images are a series of small, dark spots, which in many places seem to be aligned in chains parallel to narrow fractures.

A false-color view shows some linear features on Enceladus with a slightly different color from their surroundings. Different colors of ice may be caused by varying compositions or varying ice crystal sizes. Either one can indicate different formation mechanisms or different ages. Another early highlight from the flyby is a high-resolution stereo view of Enceladus. Stereo views are helpful in interpreting the moon's complex topography.

Other preliminary results from the visual and infrared mapping spectrometer show a surface composed of only pure water ice, with no other compounds detected. Ammonia or ammonium compounds and carbon dioxide were expected, but not seen in the data. Further analysis may find trace amounts. "The spectra look like laboratory-fabricated water ice, indicating the ice is quite pure," said Dr. Roger N. Clark, Cassini science team member at the U.S. Geological Survey in Denver.

Cassini will conduct an even closer flyby of Enceladus on March 9, coming within about 500 kilometers (310 miles) of its surface. More than 40 additional Titan flybys are planned.

The pictures are available at <http://saturn.jpl.nasa.gov> and <http://www.nasa.gov/cassini>.

View this and previous issues of Universe at
<http://universe.jpl.nasa.gov>

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Notice to Advertisers

Advertising is available for JPL and Caltech employees, contractors and retirees and their families. No more than two ads of up to 60 words each will be published for each advertiser. Items may be combined within one submission. Ads must be submitted via e-mail to universe@jpl.nasa.gov and are due at 2 p.m. on the Monday after publication for the following issue.

All housing and vehicle advertisements require that the qualifying person(s) placing the ad be listed as an owner on the ownership documents.

Holzmann

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Holzmann was well familiar with JPL before he came on board, having enjoyed his work collaborating on small analysis projects for the Cassini, Pathfinder and Deep Space 1 missions. “That was one of the big reasons I wanted to work here,” he said.

Holzmann is reminded of his early career at Bell Labs, when the company had “an enormous pool of talent. At JPL, when you run into people they’re never talking about football or the weather—they’re talking about science. It’s been very inspiring.”

Retirees

The following JPL employees retired in February:

Charles Stelzried, 52 years, Section 9700; Takashi Kiriyaama, 47 years, Section 2744; James Randolph, 41 years, Section 312A; Joachim Voeltz, 40 years, Section 3756; Paul Reichley, 36 years, Section 3340; Sheldon Rosell, 36 years, Section 8800; Jerry Brown, 30 years, Section 1670; Juer-gen Linke, 28 years, Section 3755; Abraham Riley, 27 years, Section 3850; Alexander Mileant, 25 years, Section 333K; Cheryl Johnson, 20 years, Section 3117; Wu-Yang Tsai, 17 years, Section 3346; Helga Mycroft, 13 years, Section 2125; Michael Sandor, 13 years, Section 5141; Ernest Breig, 10 years, Section 2812.

Letters

My sincere gratitude to all the wonderful people who offered their support and condolences when my brother passed away. It is during a time like this that you realize someone’s true character, and I am proud to work with such wonderful human beings. Thank you so very much.

Maday Anderson

Classifieds

For Sale

BUNK BED, 4 yrs. old, pine w/maple (reddish) stain, rustic look, gd. cond., includes mattress boards (no mattresses), \$100. 249-2123.
CAMCORDER, Sony DCR-HC40E, PAL, miniDV, new in orig. box, bought for \$700 for 2004 Christmas, sell for \$500. 885-6317 or Peter_Peng_888@hotmail.com.
CHAIR, Barcalounger, beautiful light brown leather, reclines, gd. cond., \$340. 323/913-1190, Daniel.
CLOTHES for infant, red/navy blue zip-up jacket w/hood (Old Navy), size 2T, exc. cond., \$5/obo; sweater, sky blue w/navy trim buttons, size 3T, \$1/obo; zipper shoes (Spongebob motif), size 11M, exc. cond., \$5/obo, photos on request. 626/791-6101.
COMPUTER, brand new Compaq Presario laptop in unopened box, model no. 2227US, MSRP \$929.99, sell for \$750. 626/241-7084, Steve.
COUCH and 3 glass tables, exc. cond., photo available, \$75. 726-5129, Natalie.
COUCH, 9’, gd. cond., \$275/obo. 943-6661.
DAGGERS, 2, Moroccan, antique, gd. cond., made around 1900, sheathed in their own scabbard, \$75/ea. 352-4033, after 5 p.m.
DOGS, miniature schnauzer puppies, black, 2/2m, ready now, very loving/affectionate, dewclaws, tails docked, shots, AKC papers, home raised, paper trained, \$850-\$950. 661/273-9095, Sandy.
EXERCISE EQUIPMENT: Sharper Image SR409 elliptical strider, fold-away with heart rate monitor, great cond., \$190 new, \$55; PaceMaster 870X, treadmill, digital DC drive, manual incline, gd. cond., \$40 (heavy, you move); Volt rowing machine, folds neatly, gd. cond., \$35. 661/297-0219.
FURNITURE: S. Harris 3-pc., tan, sectional sofa w/14 pillows, down-stuffed seats and 3” foam, exc. cond., left side 40” x 148”, rt. side 40” x 132”, pic via e-mail, \$950/obo (retail \$10,700). 626/441-8444 or dlnels@sbcbglobal.net.
FURNITURE: 4-shelf walnut bookcase, 6’ x 3’ x 1’, \$75 obo; 6-shelf cherry bookcase, 7’ 4” x 3’ x 1’, \$100/obo; 2-sided Chinese Coromandel painted wood screen w/4 panels, 6’ H x 5’ 4” W, \$300/obo; 4-drawer, metal office filing cabinet, 36” W, \$75/obo. 626/441-8444 or dlnels@sbcbglobal.net.
FURNITURE: Ikea loft bed frame and full mattress, barely used in guest bedroom, \$150; TV/VCR cabinet, whitewash, \$25; 29 vinyl blinds, alabaster, \$5 ea. 427-8553.
FURNITURE: contemporary dining room table with 6 high-back chairs, black metal/wood base w/glass top, 42” x 72” with matching ceiling lamp, \$350. 730-9777.
FURNITURE: bed, brand new, twin mattress/box spring/frame, never been used, bought \$400, sell \$150; poster bed and matching dresser, soft pine, gd. cond., \$500/obo; baby changing table/dresser, \$150/obo; Ikea kids armoire, \$75/obo. 541-0882.

INVERSION TABLE, Hang Ups F5000III, hang upside down for back relief, like new, paid \$300, used 10 times, sell for \$175/obo. 626/577-2882.
JEWELRY: ladies new Coach Metropolitan brown leather strap watch, \$50; 14K tri-color gold diamond-cut bracelet, \$150; 14K 2-sided, 18” diamond-cut necklace, \$200. 653-9037.
JUICE FOUNTAIN, Breville, powerful stainless steel motor, great for daily juicing, used 2-3 times, orig. package, \$80/obo. 626/840-0955.
LAMINATOR, GBC Ultima 65-1, 18 mo. old, was \$2,965, sacrifice at \$2,400/obo. 626/962-7668, after 6 p.m.
MATTRESS, Tempur-Pedic + foundation, queen, almost new, exc. cond., great for back, \$975. 352-4033, after 5 p.m.
MICROWAVE OVEN, white, Panasonic, 1000w, good size for office or apartment, owner’s manual included, \$40. 323/342-9363.
MISC: 19” TV w/o remote, \$20; Staples Z-Line Venus Tower computer desk, \$60; Ikea grey/silver Enetri shelving unit, \$40. 389-4593, Mark.
MISC: Kandinsky poster print, professionally framed/matted, 34” square, \$50/obo; Olympia electronic typewriter, automatic bolding, centering, underlining, erasing, extra-wide car-riage, exc. cond, w/extra ribbons/erase tapes, carrying case, \$50/obo; foot massager/foot bath, ConAir, orig. box, never used, \$30. 626/355-3886.
MISC: bread machine, like new, \$45; Sony DV video/digital camera, never used, includes carrying case, \$300; Sony stereo: receiver with surround sound speakers and subwoofer, \$250. 626/792-9816.
MISC: mailbox, oversized, green, \$10; wig, red, shoulder length, never used, \$20; portable basketball set, adjustable (needs net), \$200; fishing pole (saltwater), \$25; bunk bed matr., good cond., \$10; baseball glove (small) & conditioner, good cond., \$15; small food chopper, \$5; oil painting, landscape autumn tones, \$100. 626/357-8210.
MISC: Yashica Profile 4000IX camera, zoom, APS, \$40/obo; walkie talkie, Cobra Microtalk, 2-way radio, 2 units, 5-mile range, \$40/obo. 726-7701.
MISC: Xmas tree, (Greatland 6+ft. McIntyre pine, like real, \$25/obo; beanbag chair, denim exterior, \$25/obo; ottoman/foot massager, \$75/obo. 726-7701.
MISC: Color TV, Sony 32” Trinitron in wood cabinet w/built-in speakers, \$300/obo; 2-pc pantsuit, Jones of New York (jacket fully lined and slash pockets), new with tags, size 12, dark olive, (orig. \$198), \$50; jewelry: some vintage and costume, incl. clip-on earrings, very reasonable prices. 626/398-4960.
MOVING SALE, 2 apartments full of furniture must go: sofas, coffee tables, end tables, dressers, chairs and other misc. items. 626/792-9816.
NECKLACE, new ladies Paloma Picasso Daisy pendant, platinum, round brilliant diamonds from Tiffany, .15 carat total, G color, VS clarity; on 16” chain, paid \$1,500, sell for \$900. 653-9037.
PIANO, baby grand, Chinese red with symbols, from the 1920s, very unique and beautiful, \$2,800. 626/296-3441.
SHREDDER/MULCHER, Sears Craftsman, 5 HP, exc. cond., \$250. 790-2013, Robert Ferber.
STEREO, Sony LBT-G2000 bookshelf system w/3-disc CD changer, remote, owner’s manual, \$75. 323/342-9363.
STOVE/RANGE, vintage Wedgewood, early 1950s, beautiful, works well, 4 burners & center griddle, folding shelf, bullet lights, clock & timer, oven, broiler, storage bins, \$700/obo; DINING SET, gorgeous hand carved, 7-piece, solid rosewood, grapes motif, table has 2 leaves; 4 chairs, 2 armchairs, beautiful cond., incl. covers for chairs, pics avail., purchased for \$1,400, sell for \$750/obo. 626/282-8382.
TREADMILL, Trimline 3300, pushbutton control, programmable display time, speed, distance, elevation, calories, exc. cond., \$250. 248-6040.
TV, 25” Sharp color; + DVD player, Daewoo, \$100. 952-4444, x104.
TROPICAL PLANTS, plumerias, variety of colors and sizes; shell gingers.626/444-6156, Annie & Bob DePonte.
WASHING MACHINE, Kenmore 90 Series, 1999, vg cond., \$75; animal carrier, for transport, large, used once, \$50; hamster cages, small, \$5, large \$10. 790-2915, Dick/Ruth.
WHEELCHAIR, Jazzy brand, all-electric, exc. cond., barely used, \$1,000. 909/620-9234.
YARD SALES, Phillips Ranch, start here on Saturday, March 5 at 21 Comanche Circle, the city of Phillips Ranch hosts “yard sale weekend.” 7 a.m.-3 p.m.

Vehicles / Accessories

’98 BMW 740i, V8, 290 HP, 94K mi., white, exc. cond., loaded, beautiful ride and handling, premium sound, sunroof, 6 airbags, stability control, extended warranty for 1 more year, \$16,500/obo. 909/592-2279.
’85 BMW 318i, 2-dr., runs good, power win., standard, \$500. 323/533-7961.
’98 FORD Explorer XLT, V8, black, tan leather int’r’r, pwr everything, 6-CD changer, rear air,

Holzmann is modest about the National Academy of Engineering honor. He doesn’t know who nominated him for the award and thinks he may not ever find out. But that’s OK.

“I’ve enjoyed it immensely, it’s been very rewarding,” he said. “I have an enormous respect for the people who work here. I now understand how dedicated and passionate people are about their work. It’s really a joy to work in this environment.”

cruise control, gd. cond., a few scratches, etc., \$7,500/obo, KBB-\$8,500. 352-9418, Lee.
’66 FORD Mustang, V8, 289, 4 barrel carb., light blue interior and exterior, black plates, always a California car, no accidents, exc. orig. shape, drives like it’s new, mature owners, beautiful, \$18,000. 626/296-3441.
’03 GMC Sonoma truck, 3 dr. extended cab, SLS trim, one owner, auto, 14,400 mi., a/c, power steering, tilt wheel/cruise control, CD player, aluminum wheels, tachometer, heavy-duty suspension, white color, exc. cond., under warranty, \$12,995. 952-0047.
’03 HONDA Accord LX, 4 dr., power windows, power locks, CD player, a/c, white color, auto, 40K mi., exc. cond., \$14,000. 909/599-3230.
’03 LEXUS GS300, black, camel leather interior, factory chrome wheels, 6-disk CD changer, floor & trunk mats, dealer serviced, professionally detailed, transferable factory warranty, less than 10K mi., immaculate, pics at 2.lisa@veizon.net, below Blue Book, \$31,000 firm. 909/989-1183.
’01 TOYOTA Corolla CE, manual trans, 4 dr., 43K mi, oil changes only required, white w/minor scratches, 4 Michelin tires recently replaced, \$7,995. 626/577-2882, Linda.
’99 TOYOTA Camry LE, auto, a/c, am/fm/cass./CD, cruise control, all power, 88K mi., vg cond., new tires, \$7,300/obo. 831-2923.
’99 TOYOTA Corolla VE, 73K mi., silver exterior, gray interior, CD player, am/fm/CD, power locks w/alarm, Kenwood stereo, exc. cond., \$7,000/obo. 626/844-7802.
’98 TOYOTA Sienna LE, exc. cond., orig. owner, 81K mi., dealer maint’n’d, loaded w/options: 2nd sliding door, capt. chairs, premium sound, security sys. w/remote keyless entry, roof rack, towing pkg., alloy wheels, sable pearl exterior, beige interior; sacrifice for \$8,910, (\$1,000 below Blue Book). 626/646-1937, David.

Wanted

BOOKS, used or new, paperback, hardback or magazine, romance, science fiction, mystery, etc. 248-0178, engineerbob4449@yahoo.com.
SENGER, used. 909/944-1959, please leave message.
SINGER, 20-26 years of age, influences: Sevendust, 311, Deftones. 626/357-8210.
SINGER, female, to volunteer for occasional senior entertainment. 626/840-0955.
SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. 790-8523, Marc Rayman.
VOLLEYBALL PLAYERS, coed, no beginners please, Tues. 8 to 10 p.m. at Eagle Rock High School, \$4/night. 956-1744, Barbara.

Lost & Found

FOUND: Set of keys, in the 601 parking lot. Ext. 4-9550, Barbara.

For Rent

ALTADENA, comprehensively furnished for extended stays: 3 bd., study, boundary Angeles Nat’l Forest, 3 mi. / JPL (trails to Lab behind house), view, fireplace, oak floors, antiques; furn., beds, dinnerware, utensils, pots/pans, all linens & towels, fine soaps, necessities included; just bring toothbrush & clothes; TV/ DVD/VHS, Dish satellite, wireless DSL; gar-dens, patio, parking; private, immaculate. 626/798-3235.
ALTADENA room, share 2 bd., 1 ba. home, ~3 mi. from JPL with 1 focused student and a cat, \$525 + half util. and DSL. 626/345-0625.
ARCADIA condo, large, sunny, 3 bd., 2.5 ba., central a/c, quiet street, secluded end unit, private front & side yard, move-in cond., freshly painted, new carpets & appliances, washer/dryer hookups, lots of storage space, 2-car attached gar., access to pool, close to shopping center, exc. school district. 913-9293.
COVINA, 1 bd. in a 3-bd., 2-ba. house, shared common area, quiet residential street, close to shopping plazas, minutes from 210. 57 and 10, non-smoker, no pets, \$500 + security deposit, utilities included. 626/938-0391, room@hostinc.net.
EAGLE ROCK, near Figueroa and Yosemite, 1 bd. and den triplex, fireplace, oak floors, French doors, brick patio, fenced yard, updated kitchen, lg. bath. \$975. 790-1209.
GLENDALE/EAGLE ROCK area, 1 bd. in a 3 bd. 1 ba. with closet; laundry & kitchen privileges incl., close to all, 12 min./JPL, avail. March 1, \$550, util. incl. 323/340-8605.
GRANADA HILLS, 5 + 4, 3.083 sq. ft. living space, 18,463 sq. ft. yard, Knollwood estate on golf course, pool, spa, park-like front and back yard, owner (me) pays gardener and pool man, at least 1-yr. lease. 648-0627, shrike_sun@yahoo.com.
MONTROSE, 1 bd., 1 ba., Stancrest condo to lease March 1; near Montrose shops, theater, hiking trails, washer/dryer, gas fireplace, priv. patio by pool, spa, gym, entertainment suite, secure parking for 2 cars, \$1,350. 790-4097.
PASADENA, beautiful 3 bd., 2 ba. home in Hastings Ranch, remod. kitchen w/new appliances, remod. baths, cent. heat and a/c, hardwood floors, refrig., washer/dryer, den wired for 4 computers, speakers throughout, pool &

covered patio w/wet bar; \$3,200 & utils & sec. dep., gardener & pool service included; avail. 3/1. 626/351-9641 or bettyrns@earthlink.net.
PASADENA, 2 bd, 1 ba. house, newly remodeled kitchen and bath, nice size dining area, quiet street, close to shopping and freeways, \$1,750. 626/688-6188.
PASADENA cottage, 1 bd., 1 1/2 ba., your own 4 walls, hardwood floors, 1 story, lovely garden, near Eaton Cyn., near bus to JPL, neighbors JPLers; gas stove, fridge, window a/c; cable-ready, private washer/dryer, garage, about 6 mi. from JPL, owner pays water & trash, maintains grounds; no dogs, other pets negotiable, non-smokers only, avail. ~April 1, \$935 + \$1,000 security. 626/794-1841, Claire Marie-Peterson.
PASADENA house, Spanish style, newly remodeled kitchen, 2 bd., 1ba., 2-car detached garage, lg. front & back yard, patio, close to freeways, shopping and JPL. 213/819-1883.

Real Estate

BELIZE rain forest, 100.1 acres, property has a stream (w/pools and small rock water falls), hills, flats, views, thick jungle, good farming soil, land for livestock, visiting howler monkeys, access roads; located in Cayo district near San Egnacio city, could be used as resort, home or ranch, solar power & water filtering could be installed, photos available, \$89,000. 363-9999.
WEST PALMDALE (93551), house in very quiet cul-de-sac, built 1990, 4 bd./3 ba., 2,340 sq. ft., 2 story, 3-car attached gar., 3/4 acres lot, 2 fireplaces, 2 a/c, very unique hilltop view property w/long private driveway, room for several cars to park, wide access into rear yard for RV, avail. 3/1, photos on request, reduced to \$415,000. 626/791-6101.

Vacation Rentals

BIG BEAR LAKEFRONT luxury townhome, 2 decks, indoor pool/spa, near skiing, beautiful master bd. suite, sleeps 6. 949/786-6548.
CAMBRIA ocean front house, exceptional white water view, accom. up to 4 people, all amenities provided, Jan. & Feb. special, 3rd night free, except holidays. 702/256-1359 & creynolds2@cox.net.
CARMEL, Hyatt Highlands Inn, resort overlooks ocean, 1 bd., living room and fully-equipped kitchen, wood-burning fireplace, spa tub, private balcony, binoculars, complimentary bicycles, sleeps 4, July 2-9, ‘05, \$135/nt., additional locations avail. 626/794-9579 or fivestarresorts@earthlink.net.
FLORIDA condo, beautifully furnished 2 bd., 2 ba., 2nd floor, on the surf of New Smyrna Beach, 1/2 hour to Cape Canaveral, 90 min. to Disney World; enjoy all the comforts of home; quiet, relaxing, overlooking the beach and the Atlantic Ocean; BBQ, pool, game room; easy walk to stores and restaurants. 760/439-7821, Darlene, or dhauge@yahoo.com.
HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd w/loft, compl. furn. phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps. 4, laundry fac., low season rate \$115/nite/2, high season \$130/nite/2, \$15/nite/add’l person. 949/348-8047, jackandrandy@cox.net.
LAKE TAHOE, Marriott Timber Lodge in Heavenly Village, studio, queen bed, full sofa bed, sleeps 4, microwave, small refrigerator, dishes, coffee maker, 5 blocks from lake, Aug. 5-12, ‘05, \$60/nt., standard Marriott rate is \$200+/nt., additional locations avail. 626/794-9579 or fivestarresorts@earthlink.net.
MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip’d kitchen incl. micro-wave, D/W, cable TV, VCR, phone, balcony w/mtn. view, Jacuzz., sauna, streams, fishponds, close to Mammoth Creek, JPL disclnt. 626/798-9222 or 626/794-0455 or valeriec@caltech.edu.
OCEANSIDE beachfront: lovely 2 bd., 2 ba., single-level deluxe condo; fireplace, white water ocean views (end unit), luxurious gated complex on the sand, game rooms, fitness room, pools, barbecues, Jacuzzis; 10-min. walk to pier or harbor, sleeps 6, JPL discount; www.beachvisitors.com. 760/433-4459.
OCEANSIDE condo, on the sand, charming, 1 bd., panoramic view, walk to pier or harbor, pool/spa, game room, slps. 4. 949/786-6548.
OREGON, Brookings, Moosehead Lodge, www.mooseheadlodgeoregon.com, at the Winchuck River Estuary, fully furnished 3 bd., 2 ba., residence, 1 mi. from Cal. border, walk Pelican Bay beach w/tidepools, surf and driftwood, fish Pacific Ocean/Wild Rivers along S. Oregon/N. Cal. coast, enjoy the redwoods and Siskiyou National Forest. 800/221-8175.
PARK CITY, UTAH studio condo, 2 queen beds, indoor pool/Jac., spa, fitness center, kitchenette includes: small frig./freezer, microwave, stove, toaster, blender, coffee maker, pots/pans, dishes; cable TV, VCR/DVD, phone, balcony, 24 hr. desk, concierge, child care, laundry service, free transportation to ski resort and Main St. (both within 1-2 mi.), JPL discount. garyglass500@charter.net.
ROSARITO BEACH condo 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.



JPL
Women's
History
Month
Luncheon

Celebrating the Voice of Women— Women Change America

h o n o r i n g

Dr. Susan Love

*President and Medical Director,
Dr. Susan Love Research Foundation,
Pacific Palisades, California*



Tuesday, March 15, 2005

11:30 am – 1:30 pm

Brookside Country Club

1133 N. Rosemont Ave., Pasadena

Seating is limited.

All JPL employees are invited to attend.

Ticket Information

Tickets are \$22 and can be purchased by sending a check (payable to ACW) to Pat Barley, JPL M/S 125-177, plus the completed Luncheon Ticket Request Form at the bottom of this page. Your ticket will be sent to you via JPL mail. No refunds will be given once a ticket has been issued. One ticket per person.

**Luncheon Ticket
Request Form**

Please Print

Name _____

M/S _____ Ext. _____

Are you an ACW Alumna: ☐ Yes ☐ No

Menu Options (please indicate your choice):

☐ Cobb Salad ☐ Mandarin Chicken Salad ☐ Pasta Primavera (vegetarian option)



DR. SUSAN LOVE:

*Pioneer in the
exploration and
discovery of
new technologies
for treating and
curing breast
cancer*

According to a National Cancer Institute report, one out of every seven women born now in the United States will develop breast cancer at some time in their lives. Many of us have a close friend, sister, mother, or wife who has had breast cancer. Some of us are breast cancer survivors. Are you prepared to cope with such a diagnosis? What is being done to find new treatments and eventually cure this disease? Knowing and understanding breast cancer is not only important to women but equally important to the men who know them.

Attend the ACW luncheon to hear Dr. Susan Love, a pioneer in the exploration and discovery of new technologies for treating and curing breast cancer, talk about the important work she is doing. She is the author of *Dr. Susan Love's Breast Book*, termed "the bible for women with breast cancer" by the New York Times. Dr. Love has developed a new, non-invasive technique for breast cancer detection, which is breaking new ground in early diagnosis of the disease.

Dr. Love is known worldwide as one of the founders of the breast cancer advocacy movement. She is President and Medical Director of the Dr. Susan Love Research Foundation, a non-profit organization dedicated to the eradication of breast cancer. The organization's goal is to identify the barriers to research and then to create new solutions. Dr. Love currently sits on the Board of the National Breast Cancer Coalition. She is also a Clinical Professor of Surgery at UCLA and former director of the UCLA Breast Center. Dr. Love is dedicated to breast cancer research, awareness, education, and advocacy.